File 231/1/154

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Christopher George FOUNTAIN et al

SERIAL NO.: 10/566,337 (PCT/GB2003/003203)

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FOR : AUTOMATED PLANTER

EXAMINER : UNKNOWN

ART UNIT : UNKNOWN

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Richard M. Goldberg
**(Name of Registered Representative and person mailing)**

Richard M Goldberg February 14, 2006
**(Signature and Date)**

SUBMISSION OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Enclosed is an International Preliminary Examination Report (Form PCT/IPEA/409) and Notification of Transmittal of the International Preliminary Examination Report in the above application.

Respectfully submitted,

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ENCLOSURES

# PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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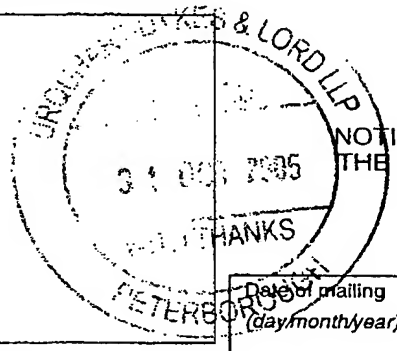


# PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

| | |
|---|---|
| | Date of mailing *(day/month/year)* 28.10.2005 |
| Applicant's or agent's file reference P352357WO/DAJ | **IMPORTANT NOTIFICATION** |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/GB 03/03203 | 29.07.2003 | 29.07.2003 |

Applicant
ULTRACELL LIMITED ET AL.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

| Name and mailing address of the international preliminary examining authority: | Authorized Officer |
|---|---|
| European Patent Office - P.B. 5818 Patentlaan 2<br>NL-2280 HV Rijswijk - Pays Bas<br>Tel. +31 70 340 - 2040 Tx: 31 651 epo nl<br>Fax: +31 70 340 - 3016 | Viegas da Cruz, I<br>Tel. +31 70 340-1923 |

Form PCT/IPEA/416 (January 2004)

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| Applicant's or agent's file reference<br>P352357WO/DAJ | **FOR FURTHER ACTION** | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
|---|---|---|
| International application No.<br>PCT/GB 03/03203 | International filing date *(day/month/year)*<br>29.07.2003 | Priority date *(day/month/year)*<br>29.07.2003 |
| International Patent Classification (IPC) or both national classification and IPC<br>A01C11/02 | | |
| Applicant<br>ULTRACELL LIMITED ET AL. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 15 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 11 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

| Date of submission of the demand | Date of completion of this report |
|---|---|
| 24.02.2005 | 28.10.2005 |
| Name and mailing address of the international preliminary examining authority:<br>European Patent Office - P.B. 5818 Patentlaan 2<br>NL-2280 HV Rijswijk - Pays Bas<br>Tel. +31 70 340 - 2040 Tx: 31 651 epo nl<br>Fax: +31 70 340 - 3016 | Authorized Officer<br>Oltra García, R<br>Telephone No. +31 70 340-3734 |

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB 03/03203

## I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

**Description, Pages**

1-25 as originally filed

**Claims, Numbers**

1-53 filed with telefax on 26.07.2005

**Drawings, Sheets**

1/11-11/11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   *(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

   **see separate sheet**

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application,

   ☒ claims Nos. 1-4,6,29,30 and 7,8,10-13, 15, 17, 19-28, 36, 40, 42, 44-52 (insofar these claims are linked with claims 1 or 29) and 53

   because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

   ☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 53 are so unclear that no meaningful opinion could be formed *(specify)*:

   **see separate sheet**

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☒ no international search report has been established for the said claims Nos. 1-4, 6, 29, 30 and 7,8,10-13,15,17,19-28,36,40,42,44-52 (insofar these claims are linked with claims 1 or 29)

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the Standard.

   ☐ the computer readable form has not been furnished or does not comply with the Standard.

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

   ☐ restricted the claims.

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 5,7,8,10-13,15,17,19-28,31,33,36-40,42,44-52 .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Yes: | Claims | 7,8,10-13,15,17, 19-27, 33, 36-40, 42, 44-50 |
| | No: | Claims | 5, 28, 31, 51, 52 |
| Inventive step (IS) | Yes: | Claims | 7, 8, 10-12, 15, 17, 19-27, 33, 37, 38, 42, 44-48 |
| | No: | Claims | 5, 13, 28, 31, 36,39, 40, 49, 50-52 |
| Industrial applicability (IA) | Yes: | Claims | 5, 7, 8, 10-13, 15, 17, 19-28, 31, 33, 36-40, 42, 44-52 |
| | No: | Claims | |

2. Citations and explanations

   **see separate sheet**

Re Item I

**Basis of the report**

1. The amendments to some of the claims filed with the International Bureau under Article 19(1) introduce subject-matter which makes their scope of protection broader than justified by the description and drawings, contrary to Article 6 PCT. The amendments concerned are the following:

2. In claim 1 it is not clear whether the propagating tray, mentioned in point a) and the propagation tray, mentioned in point b) must be the same or can be different trays. However, for original claim 1, and in the light of the description it is clear that they must in fact be the same tray. Therefore, the preamble of claim 1 has been construed as follows: "An automated planter comprising: a) locating means arranged to locate a propagation tray; b) means adapted to extract a plant out of a propagation tray located by the locating means; and...", as in original claim 1.
The same applies to method claim 29, which will be construed as "A method of automated planting comprising providing: a) locating means arranged to locate a propagation tray; b) means adapted to extract a plant out of a propagation tray located by the locating means; and..."

3. The features of independent claim 5 appear to be taken partially from original claim 32 (dependent at least on original claims 1 and 22) and partially from the description. However this particular combination of features was never disclosed independently in the original application, as it should contain at least the features of the original claims 1 and 22, (see original claims and original description pages 3-7).
Therefore, claim 5 is not supported by the description as required by Article 6 PCT, as its scope is broader than justified by the description and drawings.
Independent method claim 31 and its dependent claims 32-33, 36-40, 42, 44-51 refer to the product of claim 5 and consequently their scope is also broader than justified by the description and drawings.
In order to be able to establish an opinion on this claim and on its dependent claims 7,8,10-13,15,17,19-28 and 52, insofar these claims are linked with claim 5, it will be considered that claim 5 includes also the features of original claims 1 and 22. The same applies to method claim 31 and its dependent claims.
Consequently claim 5 reads as follows:

- An automated planter comprising: locating means arranged to locate a propagation tray; plant extraction means adapted to pull a plant out of a propagation tray located by the locating means; and delivery means arranged to receive a plant extracted by the plant extraction means and deliver the received plant to the ground, wherein the delivery means comprises: a delivery assembly operable to receive an extracted plant and convey it from a first height to the ground; and plant transport means arranged to receive extracted plants from the plant extraction means and present them to the delivery assembly, said plant transport means comprising a plurality of ports; a controller for controlling the position of the holding ports relative to the delivery assembly; and a sensor, characterised in that the controller advances the plant transport means in response to the sensor such that the delivery assembly receives plants at a uniform rate.

4. The same reasoning applies to independent claim 9, which is partially based on originally filed claim 29. The features of originally filed claim 29 where never disclosed alone in the original application (claim 29 was dependent on at least claims 1, 22 and 23). Also, in the original description the features of claim 9 were always mentioned in combination with at least said other features.
Independent method claim 34 and its dependent claims 35, 36-40, 42, 44-51 refer to the product of claim 9 and consequently their scope is also broader than justified by the description and drawings.
In order to be able to establish an opinion on this claim and on its dependent claims 11,12,13,15,17,19-28 and 52, insofar these claims are linked with claim 9, it will be considered that claim 9 includes also the features of original claims 1, 22 and 23. The same applies to method claim 34 and its dependent claims.

5. Independent claim 14 seems to be based partially on claim 29 and partially in the description, but its features were never disclosed alone in the original application. Therefore the same reasoning applies to it and its dependent claims 15,17,19-28 and 52, as well as for method claim 41 and its dependent claims 42, 44-51.
In order to be able to establish an opinion on this claim it will be considered that claim 14 includes also the features of original claims 1, 22 and 23. The same applies to method claim 41 and its dependent claims.

6. Claim 16 appears to be a combination of features from original claims 5, 8 and other features from the description. Claim 18 appears to be also a combination from features

from original claims 5, 10 and other features from the description.
The same reasoning applies to their independent method claims 43 and 46-50, whose features were never disclosed alone in the original application.
In order to be able to establish an opinion on these claims it will be considered that claim 16 includes also the features of original claims 1, 3, 5 and 8, and that claim 18 includes also the features of original claims 1, 3, 5, 8 and 10. The same applies to their method claims 43 and 46-50.

Re Item III

**Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The originally filed application was considered as not meeting the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT. Three different inventions were identified, see for the reasons therefore the Extra Sheet "Invitation to pay extra fees" to the Partial International Search Report dated on March, 18th 2004.
No required additional search fees were timely paid by the applicant for the two extra inventions and, consequently, the International Search Report was restricted to the invention first mentioned in the original claims, namely the one covered by originally filed product claims 1-32 and 46 and method claims 38-45.

2. The amended version of the claims, filed on July, 26th 2005, contains 7 independent product claims (claims 1, 5, 9, 14, 16, 18 and 53) and 5 independent method claims (claims 29, 31, 34, 41 and 43).

3. Apparatus claim 1 is based on original claims 1 (part of the preamble) and 37 (part of the preamble and the characterising portion) with some modifications in the wording of the same. No search report was established for claim 37 (see point 1 above), neither for the combination of features of original claims 1 and 37.
Therefore it is not possible at this stage to give an opinion on the subject matter of claim 1, as its characterising portion refers entirely to unsearched subject matter.
Hence all claims dependent on newly filed claim 1, namely 2-4 and 6 and 7,8,10-13,15,17,19-28 and 52 insofar these last claims are linked with claim 1, refer also to unsearched subject matter.
Independent method claim 29 and its dependent claims 30, 36-40, 42, 44-51, insofar these claims are linked with claim 29, correspond to the apparatus claim 1 and therefore also refer to unsearched subject matter.
Therefore no opinion can be established on the subject matter of said claims.

4. Independent product claim 53 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The statement "...as hereinbefore described and as shown in any of the accompanying drawings." does not enable the skilled person to determine which technical features are necessary to per-

form the stated function. As it is not possible to establish the scope of protection of claim 53 no opinion can be given on the patentability of said claim.

**Re Item IV**

**Lack of unity of invention**

1. The newly filed claims do not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

2. The claims have been interpreted as indicated in Item I, Basis of the report, of this communication. This Authority considers that there are 4 inventions covered by the claims indicated as follows:

I: Product claims 5 and 7-13,15,17,19-28 and 52 insofar these last claims are linked with claim 5, as well as method claims 31 and 32-33, 36-40, 42, 44-51 directed to: an automated planter comprising plant transport means, a controller and a sensor, in which the controller advances the transport means in response to the sensor.

II: Product claims 9 and 10,11,12,13,15,17,19-28 and 52 insofar these last claims are linked with claim 9, as well as method claims 34 and 35, 36-40, 42, 44-51 directed to: an automated planter comprising means for extracting a plant which comprise an insertion member that approaches a row of plants from a transverse direction, push the foliage of the plants to one side before inserting the member and pull the plant out of the propagation tray.

III: Product claims 14 and 15,17,19-28 and 52 insofar these last claims are linked with claim 14, as well as method claims 41 and 42, 44-51 directed to: an automated planter comprising holding ports to locate and hold the plants and means for extracting a plant which comprise an extraction member which is driven transversally into the root portion of the plants to hold the plants in the holding ports whilst the extraction means are withdrawn.

IV: Product claims 16 and 18 and method claims 43 and 46-50 directed to: an automated planter comprising fingers which are sprung such that their ends are biased towards each other, a spacer member located between the fingers, and means for positioning the spacer member and the fingers adjacent to an upper surface of the root portion of the plants, and means to hold the position of the spacer while the fingers move down. In claim 18 the spacer member is adapted to engage with the upper

surface of the root portion of a plant to allow the fingers to be driven down, whereby the fingers converge to grip the root portion.

3. The definitions of the different (groups of) claimed inventions are only intended to identify said inventions in a concise manner. They may well, as such, comprise terms or generalisations which upon a close analysis could be found to extend the defined subject-matter beyond the contents of the applications as filed.

4. Document US-A-1 865 123 discloses a planter assembly in which cereal plants are picked up from a receptacle (locating means) by extracting means and transported to a plant setting means, adapted to deliver the plants to the ground.

5. The special technical features, as defined in Rule 13.2 PCT, of the first group of claims, which are intended to be a contribution over this prior art, i.e. the sensor and the controller, apparently solve the problem of controlling the transport means automatically and with safety.
The special technical features, as defined in Rule 13.2, of the second group of claims, which are intended to be a contribution over said prior art, i.e. the features mentioned in point 2, II above, apparently solve the problem of pulling out a plant from the propagation tray without damaging the foliage of the plant.
The special technical features, as defined in Rule 13.2, of the second group of claims, which are intended to be a contribution over said prior art, i.e. the features mentioned in point 2, II above, apparently solve the problem of automatically pulling out a plant from the propagation tray without damaging the foliage of the plant.
The special technical features, as defined in Rule 13.2, of the third group of claims, which are intended to be a contribution over said prior art, i.e. the features mentioned in point 2, III above, apparently solve the problem of automatically extracting a plant from a propagation tray and pacing them in a corresponding holding port.
The special technical features, as defined in Rule 13.2, of the fourth group of claims, which are intended to be a contribution over said prior art, i.e. the features mentioned in point 2, IV above, apparently solve the problem of achieving an automatic extraction means, which by its movement into the root portion of the plant will automatically grip it.

6. No same or similar special technical features, as defined in Rule 13.2, for any of the groups of inventions can be determined and different underlying problems are solved.

Moreover, it is clear that the four claimed inventions can be applied independently of each other, i.e they are not necessarily inter-related.

7. It appears therefore that no technical relationship between the various claimed inventions exists involving one or more of the same or corresponding special technical features, beside the common and already well known features described in document US-A-1 865 123. The four groups of claims are thus not so linked as to form a single general inventive concept.

8. The applicant has not paid additional examination fees neither has he indicated on which searched invention the further prosecution of the application should be based. Therefore an opinion can be given only for the invention first mentioned in the claims, namely on independent product claim 5 and its dependent claims 7, 8, 10-13, 15, 17, 19-28 and independent method claim 31 and its dependent claims 33, 36-40, 42 and 44-52.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

D1: EP-A-0 898 866 (CIRCLE TEKKO CO LTD) 3 March 1999

1. Apparatus claim 5, as mentioned in Item I, Basis of the report, of this communication, has been construed as including the features of original claims 1 and 22.

2.1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claim 5 is not new in the sense of Article 33(2) PCT.
The document D1 discloses (the references in parentheses applying to this document):

- An automated planter comprising: locating means (18) arranged to locate a propagation tray (see column 4, paragraph 18); plant extraction means (A) adapted to pull a plant out of a propagation tray (column 4, paragraph 19) located by the locating means (18); and delivery means (55, 56, 24, 25) arranged to receive a plant extracted by the plant extraction means (A) and deliver the received plant to the ground, wherein the delivery means comprises: a delivery assembly (55, 56) operable to receive an extracted plant and convey it from a first height to the ground; and plant transport means (39, C, D) arranged to receive extracted plants from the plant extraction means (A) and present them to the delivery assembly (55, 56, 24, 25), said plant transport means (C, 39) comprising a plurality of ports (41); a controller (see columns 6 and 7, paragraph 37, the electromagnetic clutch and sensor 52 control the speed of belt 39, and hence the position of the ports 41) for controlling the position of the holding ports (41, these hold the seedlings thanks to clamping belts 47) relative to the delivery assembly (55, 56, 24, 25); and a sensor (52), wherein the controller advances the plant transport means in response to the sensor (52) such that the delivery assembly receives plants at a uniform rate (columns 6 and 7, paragraph 37). (cf. claim 5)

2.2. The subject matter of dependent apparatus claims 28 and 52 is known from document D1 and therefore is not new in the sense of Article 33(1) and (2) PCT.

2.3. The subject matter introduced by dependent apparatus claim 13 represents minor

implementation details which comes within the scope of the customary practice followed by persons skilled in the art, specially as the advantages thus achieved can be readily contemplated in advance.

2.4. The additional combinations of features of dependent apparatus claims 7, 8, 10-12, 15, 17, 19-27 are not disclosed in their present form in any of the documents cited in the search report.

3.1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent method claim 31 is not new in the sense of Article 33(2) PCT.

The document D1 discloses (the references in parentheses applying to this document):

- A method of automated planting comprising providing: locating means (18) arranged to locate a propagation tray (see column 4, paragraph 18); plant extraction means (A) adapted to pull a plant out of a propagation tray (column 4, paragraph 19) located by the locating means (18); and delivery means (55, 56, 24, 25) arranged to receive a plant extracted by the plant extraction means (A) and deliver the received plant to the ground, wherein the delivery means comprises: a delivery assembly (55, 56) for receiving extracted plants and to deliver said plants to the ground; a conveyor (39) to present plants to the delivery assembly (55, 56, 24, 25) the conveyor comprising a plurality of holding ports (41); a controller (see columns 6 and 7, paragraph 37, the electromagnetic clutch and sensor 52 control the speed of belt 39, and hence the position of the ports 41) for controlling the position of the holding ports (41, these hold the seedlings thanks to clamping belts 47) relative to the delivery assembly (55, 56, 24, 25); a sensor (52), wherein the method comprises advancing the conveyor (39) in response to the sensor (52) such that the delivery assembly receives plants at a uniform rate (columns 6 and 7, paragraph 37). (cf. claim 5)

3.2. The subject matter of dependent method claim 51 is known from document D1 and therefore is not new in the sense of Article 33(1) and (2) PCT.

3.3. The subject matter introduced by dependent method claims 36, 39, 40, 49 and 50 represents minor implementation details which comes within the scope of the customary practice followed by persons skilled in the art, specially as the advantages thus achieved can be readily contemplated in advance.

3.4. The additional combinations of features of dependent method claims 33, 37, 38, 42 and 44-48 are not disclosed in their present form in any of the documents cited in the search report.

Claims

1. An automated planter comprising:

a) locating means arranged to locate a propagating tray;

b) means adapted to extract a plant out of a propagation tray;

c) a delivery assembly arranged to receive extracted plants and to deliver the plants to the ground;

d) plant transport means arranged to receive extracted plants from the extraction means to present said plants to the delivery assembly;

characterised in that

the plant transport means comprises a first and a second plant conveyor, each conveyor being adapted to receive extracted plants, and control means operable to hold one conveyor in a static state to receive the plants from said plant extraction means whilst the second conveyor is driven to present previously deposited plants to the delivery assembly.

2. A planter in accordance with claim 1, characterised in that the planter comprises n plant extraction means where n is an integer, the conveyor being adapted to receive n extracted plants substantially simultaneously.

3. A planter according to claim 1 or claim 2, characterised in that the delivery assembly comprises two endless belts arranged adjacent one another so as to be able to grip the extracted plants between opposing surfaces of the belts; and

drive means arranged to drive the belts at the same speed and such that their opposing surfaces move in the same direction.

4. A planter according to any of the preceding claims, characterised in that the transport means are adapted to receive an extracted row of plants from the plant extraction means and to present the extracted plants sequentially to the delivery assembly.

5. An automated planter comprising:

a) a delivery assembly for receiving extracted plants and to deliver said plants to the ground;

b) a plant transport means to present plants to the delivery assembly, the plant transport means comprising a plurality of holding ports;

c) a controller for controlling the position of the holding ports relative to the delivery assembly;

d) a sensor,

characterised in that the controller advances the plant transport means in response to the sensor such that the delivery assembly receives plants at a uniform rate.

6. A planter according to any of claims 1 to 4, characterised in that the plant transport means comprises a plurality of holding ports, the planter comprising a controller for controlling the position of the holding ports relative to the delivery assembly and a sensor, the controller advancing the plant transport means in response to the sensor, such that the delivery assembly receives extracted plants at a uniform rate.

7. A planter according to claim 5 or 6, characterised in that the sensor is adapted to sense plant foliage and the controller is adapted to index the plant transport means so that the delivery assembly receives properly developed plants at a uniform rate.

8. A planter according to any of claims 5 to 7, characterised in that the sensor is arranged to detect foliage of the plant being conveyed by the plant transport means; the sensor being arranged to provide a signal to the controller; the controller being further arranged to control drive means of the plant transport means, whereby, if no foliage or inadequately developed foliage is detected, the plant transport means is controlled accordingly to ensure that plants are presented to the delivery assembly at substantially regular intervals.

9. An automated planter comprising:

a) means adapted to extract a plant out of a propagation tray; and

b) a delivery means arranged to receive extracted plants and deliver the plants to the ground;

c) the extraction means comprising means for inserting at least one insertion member into the root portion of a plant to grip the root portion;

characterised in that the extraction means are adapted to approach a row of plants from a direction transverse to the row;

the extraction means are adapted to push the foliage of the plants to one side before inserting the inserting member; and

the extraction means are adapted to pull the plant out of the propagation tray.

10. A planter according to any of claims 1 to 8, characterised in that the extraction means comprises means for inserting at least one insertion member into the root portion of a plant to grip the root portion, the extraction means are adapted to approach the row of plants from a direction transverse to the row; the extraction means are adapted to push the foliage of the plant to one side before inserting the insertion member and the extraction means are adapted to pull the plant out of the propagation tray.

11. A planter according to claim 9 or 10, characterised in that the extraction means are adapted to separate the base of the root portion from the top of the propagation tray by a distance of no more than the height of the root portion, the extraction means moving the extracted plant transversely to the upper surface of the propagation tray.

12. A planter according to any of claims 9 to 11, characterised in that the extraction means are adapted to pull a row of plants simultaneously from the propagation tray.

13. A planter according to any of the preceding claims, characterised in that the extraction means extract a row of plants in alignment and translates the plants in a direction perpendicular to that line, the extraction means depositing the line of plants in relation to the plant transport means.

14. An automated planter comprising:

a) means adapted to extract the plants from a propagation tray;

b) holding ports to locate and hold the plants;

characterised in that the planter comprises extraction members adapted for insertion into the root portion of the plants, the extraction members being driven generally transversely into the root portion of the plants to hold the plants in said holding ports whilst said extraction means are withdrawn.

15. A planter according to any of claims 1 to 13, characterised in that the planter comprises holding ports to locate and hold the extracted plants; the planter comprising extraction members adapted for insertion into the root portion of the plants, the extraction members being driven generally transversely into the root portion of the plants to hold the plants in said holding ports whilst the extraction means are withdrawn.

16. A plant extraction means comprising :

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards each other,

b) a spacer member located between the fingers,

characterised in that

c) the extraction means comprises means for positioning the spacer member and fingers adjacent to an upper surface of a root portion of a plant and means for holding the position of the spacer member constant whilst driving the fingers down past the sides of the spacer member.

17. A planter according to any of claims 1 to 15,

characterised in that the plant extraction means comprises:

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards each other,

b) a spacer member located between the fingers,

characterised in that

c) the extraction means comprises means for positioning the spacer member and

fingers adjacent to an upper surface of a root portion of a plant and means for holding the position of the spacer member constant whilst driving the fingers down past the sides of the spacer member.

18. A plant extraction means comprising:

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards each other,

b) a spacer member located between the fingers,

characterised in that the spacer member is adapted to engage with an upper surface of a root portion of a plant to allow the fingers to be driven down past the sides of the spacer member, whereby the fingers are inserted into the root portion and the fingers converge to grip the root portion.

19. A planter according to any of claims 1 to 15, characterised in that the plant extraction means comprises:

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards each other, and

b) a spacer member located between the fingers, the spacer member being adapted to engage with an upper surface of a root portion of a plant to allow the fingers to be driven down past the sides of the spacer member whereby the fingers are inserted into the root portion and converge to grip the root portion.

20. A planter according to claim 17 or 19, characterised in that the planter comprises stop means for limiting movement of the spacer member so as to prevent or limit compression of the root portion surface by the spacer member.

21. A planter according to claim 17, 19, or 20, characterised in that the spacer member comprises a cut out to accommodate a plant.

22. A planter according to any of claims 17 or 19 to 21, characterised in that the engagement of the spacer member with the upper surface limits downward movement

of the spacer, thereby enabling the fingers to be driven down at its sides, so that they can enter the root portion, converge and grip the root portion.

23. A planter according to any of claims 17 or 19 to 22, characterised in that the spacer member is locatable between a retracted position and an extended position, in the extended position, the spacer member is configured such that the finger tips are prevented from extending beyond the lower edge of the spacer member.

24. A planter according to any of claims 17 or 19 to 23, characterised in that the planter comprises a plurality of plant extraction means, the planter further comprising means for actuating the respective fingers of the plant extraction means to converge substantially simultaneously.

25. A planter according to any of claims 1 to 15, 17 or 19 to 24, characterised in that the planter comprises spacing means for setting the extraction means spacing in accordance with the propagation trays.

26. A planter according to any of claims 1 to 15, 17 or 19 to 25, characterised in that the planter comprises a plurality of plant extraction means, arranged in a row whereby a row of plants can be pulled out of a propagation tray simultaneously.

27. A planter according to claim 26, characterised in that the planter comprises means for adjusting the separation of the plant extraction means in a row.

28. A planter according to any of claims 1 to 15 or any of claims 17 or 19 to 27, characterised in that the planter is a field planter.

29. A method of automated planting comprising providing:

a) locating means arranged to locate a propagating tray;

b) means adapted to extract a plant out of a propagation tray;

c) a delivery assembly arranged to receive extracted plants and to deliver the

plants to the ground;

d) plant transport means arranged to receive extracted plants from the extraction means to present said plants to the delivery assembly;

characterised in that

the plant transport means comprises a first and a second plant conveyor, each conveyor being adapted to receive extracted plants, and means for controlling the conveyors,

the method comprising

controlling the plant transport means to hold one conveyor in a static state to receive the plants from said plant extraction means whilst the second conveyor is driven to present previously deposited plants to the delivery assembly.

30. A method according to claim 29, characterised in that the transport means are adapted to receive an extracted row of plants from the plant extraction means and the extracted plants are presented sequentially to the delivery assembly.

31. A method of automated planting comprising providing;

a) a delivery assembly for receiving extracted plants and to deliver said plants to the ground;

b) a conveyor to present plants to the delivery assembly, the conveyor comprising a plurality of holding ports;

c) a controller for controlling the position of the holding ports relative to the delivery assembly;

d) a sensor

characterised in that the method comprises advancing the conveyor in response to the sensor such that the delivery assembly receives plants at a uniform rate.

32. A method according to any of claims 29 or 30, characterised in that the conveyor comprises a plurality of holding ports, the planter comprising a controller for controlling the position of the holding ports relative to the delivery assembly and a sensor, the method comprising advancing the conveyor in response to the sensor, such that the delivery assembly receives extracted plants at a uniform rate.

33. A method according to claim 31 or 32, characterised in that the sensor is adapted to sense plant foliage and the conveyor is indexed so that the delivery assembly receives properly developed plants at a uniform rate.

34. A method of automated planting comprising

a) providing means for extracting a plant out of a propagation tray;

b) providing means for delivering extracted plants to the ground;

the extraction means comprising means for inserting at least one insertion member into the root portion of a plant to grip the root portion;

characterised in that the extraction means:

approach a row of plants from a direction transverse to the row; and

pull the plant out of the propagation tray.

35. A method according to claim 34, characterised in that the extration means push the foliage of the plants to one side before inserting the insertion member.

36. A method according to any of claims 29 to 33, characterised in that the plant extraction means comprising means for inserting at least one insertion member into the root portion of a plant to grip the root portion, characterised in that the extraction means:

approach the row of plants from a direction transverse to the row,

and pull the plant out of the propagation tray.

37. A method according to claim 36, characterised in that the extraction means push the foliage of the plant to one side before inserting the insertion member

38. A method according to any of claims 34 or 37, characterised in that the base of the root portion is separated from the top of the propagation tray the extracted plant being moved transversely to the upper surface of the propagation tray whereby the plant is separated from adjacent plants with which its foliage may have been entangled,

without pulling said adjacent plants out of the propagation tray.

39. A method according to any of claims 34 to 38, characterised in that a row of plants is pulled simultaneously from the propagation tray.

40. A method according to any of claims 29 to 39, characterised in that a row of plants is extracted in alignment and the row is translated in a direction perpendicular to that line, the line of plants being deposited in relation to the plant transport means.

41. A method of automated planting comprising:

a) providing a planter comprising means for extracting plants from a propagation tray;

b) providing holding ports to locate and hold the plants;

characterised in that the planter comprises extraction members adapted for insertion into the root portion of the plants,

the method comprising driving the extraction members generally transversely into the root portion of the plants to hold the plants in the holding ports whilst said extraction means are withdrawn.

42. A method according to any of claims 29 to 40, characterised in that the method comprises

providing holding ports to locate and hold the plants;

the planter comprising extraction members adapted for insertion into the root portion of the plants,

the method comprising driving the extraction members generally transversely into the root portion of the plants to hold the plants in the holding ports whilst said extraction means are withdrawn.

43. A method of extracting plants comprising providing:

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards

each other,

b) a spacer member located between the fingers,

the method comprising engaging the spacer member with an upper surface of a root portion of a plant to allow the fingers to be driven down past the sides of the spacer member, whereby the fingers are inserted into the root portion and the fingers converge to grip the root portion.

44. A method according to any of claims 29 to 42, characterised in that the method comprises providing:

a) fingers, the fingers being sprung such that ends of the fingers are biassed towards each other,

b) a spacer member located between the fingers,

the method comprising engaging the spacer member with an upper surface of a root portion of a plant to allow the fingers to be driven down past the sides of the spacer member.

45. A method according to claim 44, characterised in that the method comprises providing stop means, the stop means limiting movement of the spacer member so as to prevent or limit compression of the root portion surface by the spacer member.

46. A method according to any of claims 43 or 44 or 43, characterised in that the engagement of the spacer member with the upper surface limits downward movement of the spacer, thereby enabling the fingers to be driven down at its sides, so that they can enter the root portion, converge and grip the root ball.

47. A method according to any of claims 44 to 46, characterised in that the method comprises providing a plurality of plant extraction means, and actuating the respective fingers of the plant extraction means to converge substantially simultaneously.

48. A method according to any of claims 29 to 47, characterised in that the method comprises spacing the extraction means in accordance with the propagation trays.

49. A method according to any of claims 29 to 48, characterised in that the planter comprises a plurality of plant extraction means, arranged in a row whereby a row of plants is pulled out of a propagation tray simultaneously.

50. A method according to claim 49, characterised in that the method comprises adjusting the separation of the plant extraction means in a row.

51. A method according to any of claims 29 to 42 or any of claims 42 to 49 characterised in that the method is a method of automatic field planting.

52. An automatic planter according to any of claims 1 to 15 or any of claims 17 or 19 to 27, characterised in that the planter is a mobile planter.

53. A planter as hereinbefore described and as shown in any of the accompanying drawings.

# PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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# PCT

NOTIFICATION CONCERNING INFORMAL COMMUNICATIONS WITH THE APPLICANT

(PCT Rule 66.6)

| | |
|---|---|
| | Date of mailing *(day/month/year)* 28.10.2005 |
| Applicant's or agent's file reference P352357WO/DAJ | **TRANSMITTAL FOR INFORMATION** |
| International application No. PCT/GB 03/03203 | International filing date *(day/month/year)* 29.07.2003 |
| Applicant ULTRACELL LIMITED ET AL. | |

An informal communication took place on 13.05.2005,between the International Preliminary Examining Authority and the applicant / the agent.

A copy of the note on that communication (Form PCT/IPEA/428) is herewith transmitted for your information.

| | |
|---|---|
| Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | Authorized Officer Viegas da Cruz, I Tel. +31 70 340-1923 |

Form PCT/IPEA/429 (January 2004)

**Vertrag über die internationale Zusammenarbeit auf dem Gebiet des Patentwesens**
**Patent Cooperation Treaty**
**Traîté de coopération en matière de brevets**

# PCT

Application No.: PCT/GB 03/03203

## Note on an informal communication by telephone with the Applicant

A copy of this note is being sent to the Applicant for information

**Participants**

Applicant: Ultracell Limited

Representative: Lynne Chave

Examiner(s): Oltra García, R

**Summary of the communication**

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Re Item I
On May 13th 2005 the representative of the applicant, Lynne Chave, phoned the examiner in order to discuss the Item III of the Written Opinion of May 4th 2005, asking what would be necessary to be able to obtain an opinion on claim 1 in respect to novelty and inventive step.
The examiner explained that as no search repport was established for the subject matter of new claim 1 (no additional search fees were timely paid) it was impossible to give an opinion on said claim.
The examiner also explained that some of the independent claims must have been formulated including the features of original claim 1, to avoid a scope of protection which was broader than justified by the original description and drawings.
The representative asked if drafting a new claim 1 which included all the features of original claim 1 would make it possible to obtain an opinion on it.
The examiner answered that that would be indeed possible as long as such a claim would refer to searched subject matter.
The representative agreed to draft such a new claim 1 with all the features of original claim 1.

**Vertrag über die internationale Zusammenarbeit auf dem Gebiet des Patentwesens**
**Patent Cooperation Treaty**
**Traîté de coopération en matière de brevets**

# PCT

Application No.: PCT/GB 03/03203

13.05.2005
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Date

Oltra García, R
.....
Authorized officer of IPEA